CLAIMS

1. A computer-implemented method for identifying one or more objects within an image, the method comprising:

receiving an image that includes at least one object;

identifying a plurality of edge pixels in the image, an edge pixel being a pixel that
5 borders two contrasting areas of the image, the plurality of edge pixels including both inner edge pixels and outer edge pixels; and

finding a substantially connected component correlated with each object, the substantially connected component comprising a set of the edge pixels that are connected by traversing substantially only edge pixels.

10 2. The method of claim 1, wherein the image includes more than one object.

3. The method of claim 1, wherein identifying a plurality of edge pixels includes computing a gradient value for each of a plurality of pixels in the image.

4. The method of claim 2, wherein computing the gradient value for a given pixel includes comparing pixel color in a neighborhood of pixels surrounding the given pixel.

15 5. The method of claim 2, wherein computing the gradient value for a given pixel includes using an image smoothing filter to filter noise from the image.

6. The method of claim 1, further comprising passing each component to a processor that extracts the location of the object from the component.

7. The method of claim 5, further comprising refining the extracted location.

20 8. The method of claim 6, further comprising using the extracted location to crop the object from the image.

9. The method of claim 1, further comprising splitting a component into two components.

10. The method of claim 1, further comprising merging two components into a single component.

11. The method of claim 1, further comprising:

extracting the location of each object from the image; and

using the extracted object location to seed a crop operation.

12. The method of claim 10, wherein using the extracted object location to seed a crop operation includes:

for each object in the image, using the extracted object location to define a cropping area; and

cropping all the defined cropping areas in a single cropping operation.

13. The method of claim 11, wherein:

the extracted object location specifies how the object is aligned with respect to the image; and

using the extracted object location to define a cropping area includes using the alignment of the object to define the alignment of the cropping area.

14. The method of claim 11, further comprising:

prior to cropping all the defined cropping areas, adjusting one or more of the defined cropping areas in response to user input.

15. The method of claim 13, wherein adjusting one or more of the defined cropping areas includes merging two cropping areas into a single cropping area.

16. The method of claim 13, wherein adjusting one or more of the defined cropping areas includes splitting a single cropping area into two or more cropping areas.

17. A computer program product, tangibly stored on a computer-readable medium, for identifying one or more objects within an image, comprising instructions operable to cause a programmable processor to perform operations comprising:

receiving an image that includes at least one object;

identifying a plurality of edge pixels in the image, an edge pixel being a pixel that borders two contrasting areas of the image, the plurality of edge pixels including both inner edge pixels and outer edge pixels; and

finding a substantially connected component correlated with each object, the substantially connected component comprising a set of the edge pixels that are connected by traversing substantially only edge pixels.

18. The product of claim 16, wherein the image includes more than one object.

19. The product of claim 16, wherein identifying a plurality of edge pixels includes computing a gradient value for each of a plurality of pixels in the image.

20. The product of claim 18, wherein computing the gradient value for a given pixel includes comparing pixel color in a neighborhood of pixels surrounding the given pixel.

21. The product of claim 18, wherein computing the gradient value for a given pixel includes using an image smoothing filter to filter noise from the image.

22. The product of claim 16, wherein the operations further comprise passing each component to a processor that extracts the location of the object from the component.

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23. The product of claim 21, wherein the operations further comprise refining the extracted location.

24. The product of claim 22, wherein the operations further comprise using the extracted location to crop the object from the image.

25. The product of claim 16, wherein the operations further comprise splitting a component into two components.

26. The product of claim 16, wherein the operations further comprise merging two components into a single component.

27. The product of claim 16, wherein the operations further comprise:
    extracting the location of each object from the image; and
    using the extracted object location to seed a crop operation.

28. The product of claim 26, wherein using the extracted object location to seed a crop operation includes:
    for each object in the image, using the extracted object location to define a cropping area; and
    cropping all the defined cropping areas in a single cropping operation.

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29. The product of claim 27, wherein:

the extracted object location specifies how the object is aligned with respect to the image; and

using the extracted object location to define a cropping area includes using the alignment of the object to define the alignment of the cropping area.

30. The product of claim 27, wherein the operations further comprise:

prior to cropping all the defined cropping areas, adjusting one or more of the defined cropping areas in response to user input.

31. The product of claim 29, wherein adjusting one or more of the defined cropping areas includes merging two cropping areas into a single cropping area.

32. The product of claim 29, wherein adjusting one or more of the defined cropping areas includes splitting a single cropping area into two or more cropping areas.

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33. A computer program product, tangibly stored on a computer-readable medium, for identifying multiple objects within a scanned image, comprising instructions operable to cause a programmable processor to perform operations comprising:

receiving a scanned image that includes multiple objects; and

identifying the multiple objects by:

(1) generating an edge pixel map of the image, the edge pixel map identifying each pixel in the image as being an edge pixel or a non-edge pixel, an edge pixel being a pixel that borders two contrasting areas of the image;

(2) scanning the edge pixel map until an edge pixel is found;

(3) computing a connected component containing the edge pixel, the connected component being a set of edge pixels that are connected by traversing only edge pixels;

(4) extracting one of the multiple objects from the connected component;

(5) erasing from the edge pixel map all the edge pixels that belong to the connected component or that are enclosed by the extracted object; and

(6) repeating steps (2) through (5) until no more edge pixels are found.

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